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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,261	12/15/2003	Mitsugu Sato	H6808.0005/P005-A	1481

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EXAMINER

JOHNSTON, PHILLIP A

ART UNIT PAPER NUMBER

2881

DATE MAILED: 06/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/734,261	SATO ET. AL.	
	Examiner	Art Unit	
	Phillip A Johnston	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>5-24-2004</u> | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

Claims Rejection – 35 U.S.C. 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 24-30, and 32 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,627,373, to Keese.

Keese (373) clearly discloses the following:

(a) An electron beam alignment correction apparatus and method that includes a source, an alignment deflector, and a pattern recognition circuit 48 that computes the axis of beam distortion between successive images. Once this axis is determined, the control circuit generates astigmatism coil control signals for compressing the beam along such axis. The astigmatism control signal magnitude then is indexed and the process repeated iteratively until the axis of highest beam distortion is less than a threshold value. When such condition is reached, the electron beam is considered to be substantially radially uniform, as recited in claims 24,25,27, and 32. See Column 3, line 47-53; and Column 6, line 52-65.

(b) Pattern recognition circuit 48 analyzes the image of magnified boundary portion 68 and generates a signal IND for indicating the position of the image of boundary portion 68 in the field of view. A indicator signal IND is generated for each of

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the extremes of the focus range. Pattern recognition circuit 48 outputs the respective indicator signals IND to control circuit 50. Control circuit 50 stores and compares portion 68 location indicator signals IND for positions in the field of view of magnified portion 68 at the extremes of the focus range. Control circuit 50 detects any translation of the magnified portion 68 and generates alignment coil control signals LC1 and LC2. Control circuit 50 provides signals LC1 and LC2 to alignment coils 22 for adjusting electron beam alignment, as recited in claim 26. See Column 6, line 52-65.

(c) Pattern recognition circuit 48 analyzes detector signal FD for imaged features of specimen S, such as position in the field of view and sharpness of the edge image. For example, in one embodiment pattern recognition circuit 48 determines the absolute value of the peak first derivative of the smoothed image intensity of each raster scan line and derives an average over all scan lines. This information is contained in signal IND provided to control circuit 50. Control circuit 50 stores and analyzes signals IND, and calculates corrections to beam alignment and astigmatism. Control circuit 50 generates control signals LC1 and LC2 for automatically correcting beam alignment, and generates control signal ASC for automatically correcting beam astigmatism, as recited in claims 28-30, and 32. See Column 5, line 37-53; and Column 8, line 3-39.

Claims Rejection – 35 U.S.C. 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 24-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,627,373, to Keese, in view of Onoguchi, U.S. Patent No. 6,067,164.

Keese (373) as applied above discloses all the limitations of claims 24-32 but fails to teach the use of a two-dimensional Fourier transform to quantify the image, as recited in claim 31. However, Onoguchi (164) discloses an astigmatism correction apparatus for correcting an astigmatism in an electron optics device by adjusting a stigmater of a charged particle beam optical system in the electron optics device, comprising: a secondary particle signal extraction unit for extracting secondary particle signals resulting from a two-dimensional scan of a charged particle beam over a sample by the electron optics device; a Fourier transform unit for calculating a power spectrum by applying a two-dimensional Fourier transform to the secondary particle signals extracted by the secondary particle signal extraction unit; a binarization unit for binarizing the power spectrum calculated by the Fourier transform unit to obtain a binarized image; an axis extraction unit for obtaining a principal axis and an axis

perpendicular to the principal axis of the binarized image obtained by the binarization unit; an astigmatism information calculation unit for determining an intensity and a direction of the astigmatism by obtaining a distance between two points at which a sample image region in the binarized image intersects with the principal axis and a distance between two points at which the sample image region in the binarized image intersect with the axis perpendicular to the principal axis; and an adjustment unit for adjusting the stigmater of the charged particle beam optical system according to the intensity and the direction of the astigmatism determined by the astigmatism information calculation unit. See Column 4, line 65-67; Column 5, line 1-25; Column 19, line 51-67; and Column 20, line 1-3.

Therefore it would have been obvious to one of ordinary skill in the art that the electron beam alignment correction apparatus and method of Keese (373) can be modified to use the Fourier transform in accordance with Onoguchi (164), to apply a two-dimensional Fourier transform to the secondary particle signals, thereby adjusting the stigmater of the charged particle beam optical system according to the intensity and the direction of the astigmatism determined by the astigmatism information calculation unit.


Conclusion

5. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor John Lee can be reached at (571) 272-2477. The fax phone number for the organization where the application or proceeding is assigned is 703 872 9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

May 25, 2004


JOHN R. LEE
SUPERVISORY PATENT EXAMINER
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